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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/087,463	02/28/2002	Adityo Prakash	10006.000720	6642

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EXAMINER	
COUSO, JOSE L	
ART UNIT	PAPER NUMBER
2621	

DATE MAILED: 12/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/087,463	PRAKASH ET AL.	
	Examiner	Art Unit	
	Jose L. Couso	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-23* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-23* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *28 March 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *10/4/02*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> **(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.**

2. Claims 1-5, 10-14 and 19-23 are rejected under 35 U.S.C. 102(b) as being anticipated by Ebrahimi (U.S. Patent No. 5,835,237).

With regard to claim 1, Ebrahimi describes a identifying candidate edge chains in an image being processed (see figure 4 and refer for example to column 6, lines 21-67); means for determining a dynamic chain-based threshold function that is dependent on at least one characteristic of the image being processed (refer for example to column 11, line 57 through column 12, line 21, in this portion of the reference Ebrahimi states that the threshold is dependent on the noise present in the signal and the local amplitude of the gradient, both of which are characteristics of the image being processed); applying the dynamic chain-based threshold function to the candidate edge chains (see figures 15A-17D and refer for example to column 12, lines 22-55), and removing from a set of edge chains those candidate edge chains that fail to pass the dynamic chain-based threshold function (see figure 6, elements 35-6 and refer for example to column 12, line 56 through column 13, line 22).

As to claims 2 and 11, Ebrahimi describes wherein the characteristic of the image comprises a local characteristic relating to a vicinity about the candidate edge chain(see figures 15A-D, 16 and 17A-D and refer for example to column 12, line 22

through column 13, line 22, which discusses the local characteristic relating to a vicinity about the candidate edge points to be used in the edge chain).

In regard to claims 3 and 12, Ebrahimi describes wherein the local characteristic is calculated per point on a neighborhood surrounding each edge point in the candidate edge chain (as is clearly illustrated in figures 15A-D, 16 and 17A-D).

With regard to claims 4 and 13, Ebrahimi describes wherein the local characteristic is used to scale a function of the candidate edge chains (refer for example to column 6,lines 3-67, which discusses that the amplitude, i.e. one of the local characteristics, which is alloted to all pixels or the relevant edge are the same, the examiner considers this allotement which provides for the same amplitude to correspond to applicant's "to scale a function of the candidate edge chains").

As to claims 5 and 14, Ebrahimi describes wherein the function comprises an integrated gradient value over edge points in each candidate edge chain (refer for example to column 12, lines 12-21, wherein the absolute value of the gradient of the signal with a kernel calculated for (a_{-w}, a_{-w+1} ... a_o ... a_{w+1}, a_w) corresponds to applicant's "integrated gradient value over edge points in each candidate edge chain").

With regard to claim 10, Ebrahimi describes a candidate edge chain identifier for identifying candidate edge chains in an image being processed (see figure 4 and refer for example to column 6, lines 21-67); means for determining a dynamic chain-based threshold function that is dependent on at least one characteristic of the image being processed (refer for example to column 11, line 57 through column 12, line 21, in this portion of the reference Ebrahimi states that the threshold is dependent on the noise

present in the signal and the local amplitude of the gradient, both of which are characteristics of the image being processed); and a threshold applicator for applying a dynamic chain-based threshold function to the candidate edge chains (see figures 15A-17D and refer for example to column 12, lines 22-55).

In regard to claim 19, Ebrahimi describes wherein the apparatus comprises a video encoder (as clearly illustrated in figure 1, and refer to column 5, lines 51-57).

With regard to claim 20, Ebrahimi describes wherein the video encoder is configured to operate cooperatively with a video decoder, and wherein the video decoder also comprises the edge identifier, the means for determining, and the thresholder (as clearly illustrated in figures 1-2 and 8, and refer for the discussion of figure 8 to column 8, lines 9-32).

As to claim 21, Ebrahimi describes wherein the apparatus comprises a video decoder (as clearly illustrated in figure 2, and refer to column 6, lines 1-9).

With regard to claim 22, Ebrahimi describes determining a dynamic chain-based threshold function that is dependent on at least one local characteristic of the image being processed (refer for example to column 11, line 57 through column 12, line 21, Ebrahimi states that the threshold is dependent on the noise present in the signal and the local amplitude of the gradient, both of which are characteristics of the image being processed), and applying the dynamic chain-based threshold function to a candidate edge chain (see figures 15A-17D and refer for example to column 12, lines 22-55).

In regard to claim 23, Ebrahimi describes an encoder (as clearly illustrated in figure 1, and refer to column 5, lines 51-57) that includes a candidate edge chain

identifier for identifying candidate edge chains in an image being processed (see figure 4 and refer for example to column 6, lines 21-67), means for calculating a dynamic chain-based threshold function that is dependent on at least one characteristic of the image being processed (refer for example to column 11, line 57 through column 12, line 21, Ebrahimi states that the threshold is dependent on the noise present in the signal and the local amplitude of the gradient, both of which are characteristics of the image being processed), and a threshold applicator for applying the dynamic chain-based threshold function to the candidate edge chains (see figures 15A-17D and refer for example to column 12, lines 22-55); and a decoder (as clearly illustrated in figure 2, and refer to column 6, lines 1-9) configured to operate in cooperation with the encoder, wherein the decoder also includes the candidate edge chain identifier, the means for calculating, and the threshold applicator (as clearly illustrated in figures 1-2 and 8, and refer for the discussion of figure 8 to column 8, lines 9-32), wherein the characteristic of the image comprises a local characteristic relating to a vicinity about the candidate edge chain (see figures 15A-D, 16 and 17A-D and refer for example to column 12, line 22 through column 13, line 22, which discusses the local characteristic relating to a vicinity about the candidate edge points to be used in the edge chain).

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 6-9 and 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ebrahimi (U.S. Patent No. 5,835,237) in view of Bonneau et al. (U.S. Patent No. 6,002,794).

The arguments advanced in section 2 above, as to the applicability of Ebrahimi, are incorporated herein.

Although Ebrahimi does not expressly describe wherein the local characteristic that is used to scale the integrated gradient value, i.e. function, comprises an extrema intensity, wherein the extrema intensity is used in calculating an intensity factor that increases rapidly for higher intensities and decreases moderately for lower intensities, and wherein the extrema density is used in calculating a density factor which deviates from around unity when the extrema density deviates from a reference density, such techniques are well know and widely used in the prior art.

Bonneau discloses an encoding and decoding of color digital image using wavelet and fractal encoding which describes wherein the local characteristic that is used to scale the integrated gradient value, i.e. function, comprises an extrema intensity (see figure 1, element 101 and refer for example to column 6, lines 46-65), wherein the extrema intensity is used in calculating an intensity factor that increases rapidly for higher intensities and decreases moderately for lower intensities (see figure 1, element 103 and refer for example to column 7, lines 50-67), and wherein the extrema density is used in calculating a density factor which deviates from around unity when the extrema density deviates from a reference density (see figure 1, element 105 and refer for example to column 8, lines 1-14, the threshold level corresponds to applicant's "which

deviates from around unit" since the modulus in a particular range will never exceed the threshold level)

Given the teachings of the two references and the same environment of operation, namely that of obtaining gradient of image edges, one of ordinary skill in the art at the time the invention was made would have been led in an obvious fashion to provide for varying the local characteristic in the function to describe the gradient in the manner taught by Bonneau in the Ebrahimi system since both systems are primarily concerned with processing edges of an image. This is an engineering design, providing for increased processing gain by providing efficient coding of edges using gradient calculations decoded as suggested by Bonneau (column 4, lines 1-67), which fails to patentably distinguish over the prior art absent some novel and unexpected result.

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Dachiku et al, Horiuchi et al and Gu et al. all disclose systems similar to applicant's claimed invention.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jose L. Couso whose telephone number is (703) 305-4774. The examiner can normally be reached on Monday through Friday from 6:30 to 3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Boudreau, can be reached on (703) 305-4706. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-8576.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jlc
December 17, 2004

JOSE L. COUSO
PRIMARY EXAMINER